

Hypertension: An Evolving Picture

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Renal Disease in Hypertension

A Historical Perspective

- Traube (Berlin, 1856) "High Blood Pressure Is Needed"
 - Postulated that arterial pressure was elevated to overcome mechanical resistance against blood flow through thickened arteries.
 - Believed that increased blood pressure was necessary for excretory efficiency of the kidney.
 - Promoted these concepts which were unchallenged for almost 80 years.
- Page (Cleveland, 1934) "High Blood Pressure Is NOT Necessary"
 - Developed renal clearance techniques that estimated renal blood flow in humans.
 - Reduced elevated blood pressure without a fall in urea clearance.
 - Demonstrated that early antihypertensive measures were not detrimental to renal function.
 - Radical sympathectomy in essential & malignant hypertension safely lowered arterial blood pressure without loss of renal function.

A Perspective

The greatest danger to a man with high blood pressure lies in its discovery, because then some fool is certain to try and reduce it.

Paul Dudley White M.D. 1931



FDR Blood Pressure Tracings 1945

- **FDR's blood pressure during 1945 reached dangerously high levels. In the wake of the President's examination at Bethesda Naval Hospital in March of that year, FDR's blood pressure was monitored closely. This chart shows that his blood pressure remained very high for the month of April 1945.**

Another Perspective

Overzealous attempts to lower blood pressure may do no good and often harm. Many cases of essential hypertension not only do not need any treatment but are much better off without it. Generally the less said about blood pressure in such people, the better.

Scott, Tice's Practice of Medicine 1946

1946-1967

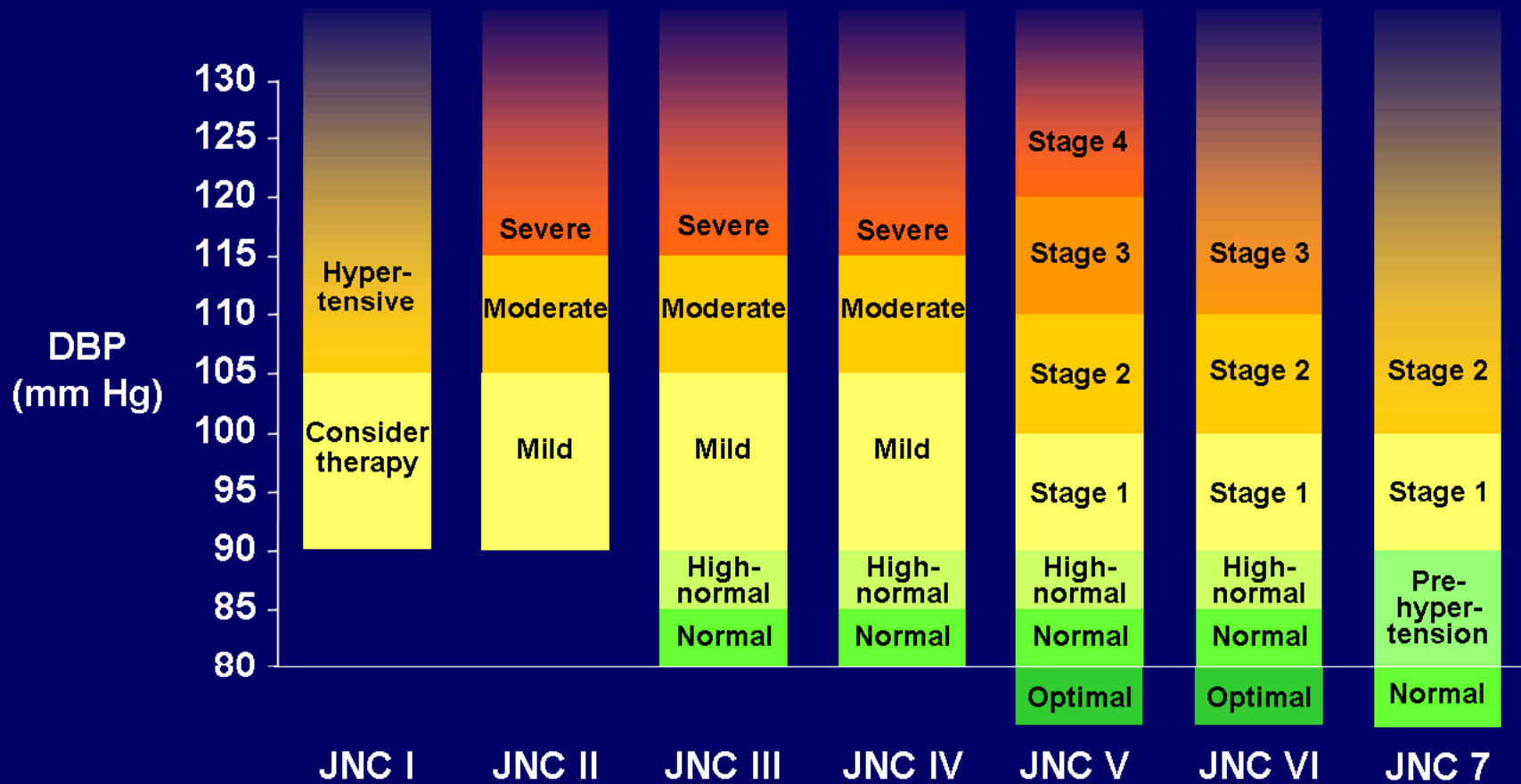
The perceptions of
hypertension begin to
change

Examples of Clinical Trials That Have Impacted Hypertension Treatment Management

| | | | |
|--|---|---|---|
| <p>1967 — VACSAA</p> <p>HCTZ Reserpine Hydralazine</p> <ul style="list-style-type: none"> • Reduced fatal & non-fatal morbid events | <p>1979 — HDFP</p> <p>Stepped care with diuretic to anti-adrenergic to vasodilator to guanethidine</p> <ul style="list-style-type: none"> • 20% reduction in mortality | <p>1980 — ANBPS</p> <p>Stepped care with diuretic to BB</p> <ul style="list-style-type: none"> • Reduction in CV mortality | <p>1991 — SHEP</p> <p>Chlorothalidone +/- atenolol</p> <ul style="list-style-type: none"> • Reductions of SBP; reduced CV events and mortality |
| <p>1998 — HOT</p> <p>Felodipine (CCB) + ASA or felodipine + placebo</p> <ul style="list-style-type: none"> • Benefit of lowering DBP in reducing major CV events | <p>1998 — UKPDS</p> <p>Type 2 diabetic patients with hypertension + tight BP control (< 150/85 mm Hg)</p> <ul style="list-style-type: none"> • Showed long-term benefits | <p>2002 — ALLHAT</p> <p>CCB, ACE-I, or α-blocker vs diuretic</p> <ul style="list-style-type: none"> • Majority of patients required combinations of 2 or more drugs to get to BP goal | <p>2005 — ASCOT</p> <p>Compare regimens: BB + diuretic vs CCB + ACE-I</p> <ul style="list-style-type: none"> • CCB + ACE-I regimen superior at reducing risk of CV mortality, stroke, fatal CHD, and DM |

HCTZ = hydrochlorothiazide; BB = β -blocker; CV = cardiovascular; CHD = coronary heart disease; DM = diabetes mellitus; SBP = systolic blood pressure; DBP = diastolic blood pressure; ARB = angiotensin-receptor blocker; CCB = calcium-channel blocker; ACE-I = angiotensin-converting enzyme inhibitor; VACSAA = Veterans Administration Cooperative Study on Antihypertensive Agents; HDFP = Hypertension Detection and Follow-Up Program; ANBPS = Australian National Blood Pressure Study; SHEP = Systolic Hypertension in the Elderly Trial; HOT = Hypertension Optimal Treatment Study; UKPDS = UK Prospective Diabetes Study; ASCOT = Anglo-Scandinavian Cardiac Outcomes Trial; ALLHAT = Antihypertensive and Lipid-Lowering Treatment to Prevent Heart Attack Trial.

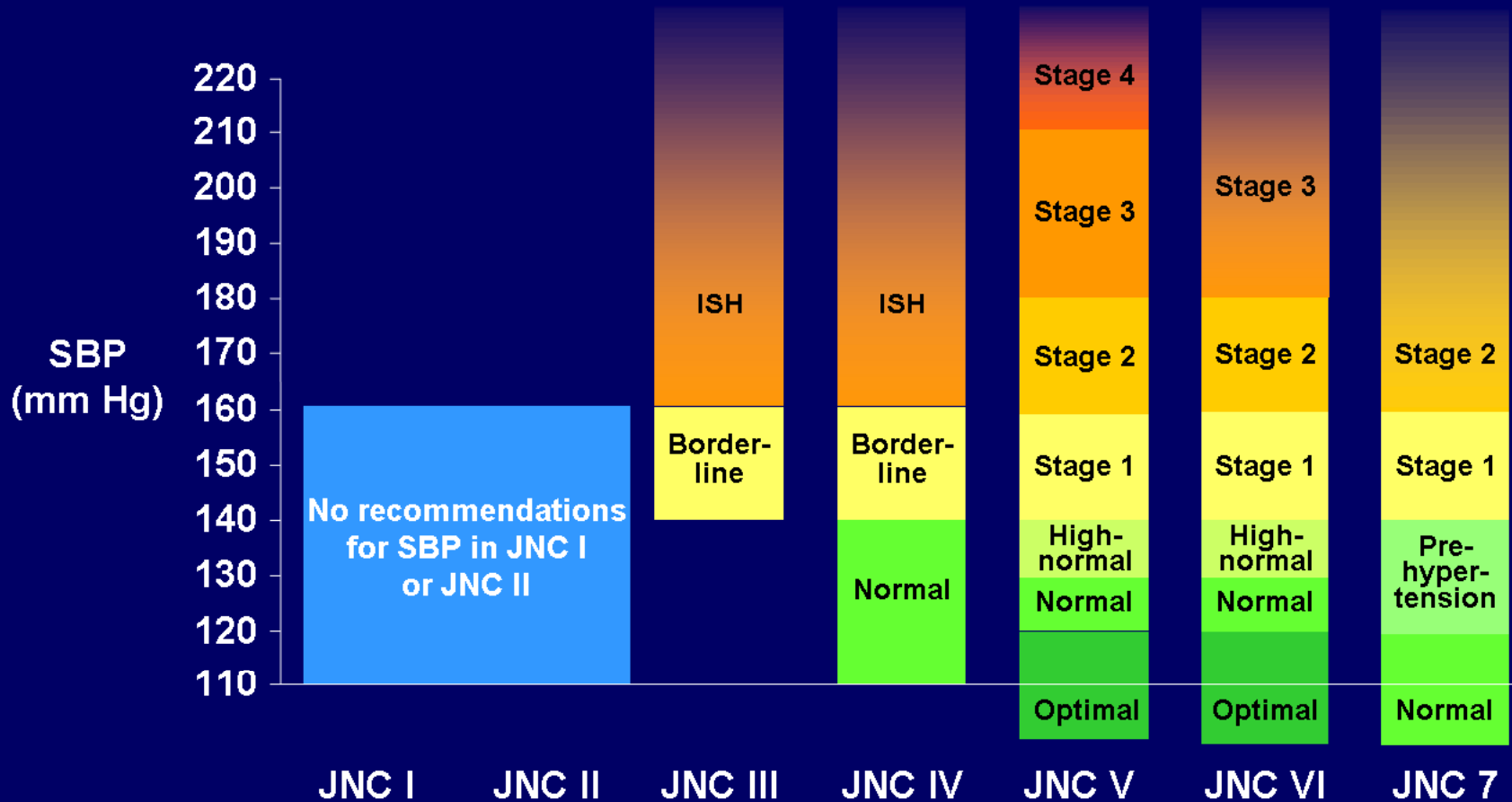
Evolution of DBP Classification



DBP = diastolic blood pressure.

JNC I. *JAMA*. 1977;237:255-261; JNC II. *Arch Intern Med*. 1980;140:1280-1285; JNC III. *Arch Intern Med*. 1984;144:1045-1057; JNC IV. *Arch Intern Med*. 1988;148:1023-1038; JNC V. *Arch Intern Med*. 1993;153:154-183; JNC VI. *Arch Intern Med*. 1997;157:2413-2446; Chobanian AV et al. *JAMA*. 2003;289:2560-2572.

Evolution of SBP Classification



SBP = systolic blood pressure; ISH = isolated systolic hypertension.

JNC I. *JAMA*. 1977;237:255-261; JNC II. *Arch Intern Med*. 1980;140:1280-1285; JNC III. *Arch Intern Med*. 1984;144:1045-1057; JNC IV. *Arch Intern Med*. 1988;148:1023-1038; JNC V. *Arch Intern Med*. 1993;153:154-183; JNC VI. *Arch Intern Med*. 1997;157:2413-2446; Chobanian AV et al. *JAMA*. 2003;289:2560-2572.

Evolution of Treatment Recommendations

| JNC I | JNC II | JNC III | JNC IV | JNC V | JNC VI | JNC 7 |
|--|---|---------------------------|--|---------------------------|--|---|
| 1977* | 1980† | 1984‡ | 1988§ | 1993¶ | 1997# | 2003** |
| Stepped care diuretic to methyldopa, reserpine, or propranolol | Stepped care diuretic to adrenergic-inhibiting agents | Thiazide diuretics or BBs | Thiazide diuretics, BBs, ACE-Is, or CCBs | Thiazide diuretics or BBs | Thiazide diuretics or BBs; for reno- and cardio-protection ARBs recommended in patients intolerant of ACE-Is | Thiazide diuretics, ARBs, ACE-Is, BBs, or CCBs; combination therapy for Stage 2 |

BB = β -blocker; ACE-I = angiotensin-converting enzyme inhibitor; CCB = calcium-channel blocker; ARB = angiotensin-receptor blocker.

*JNC I. *JAMA*. 1977;237:255-261; †JNC II. *Arch Intern Med*. 1980;140:1280-1285; ‡JNC III. *Arch Intern Med*. 1984;144:1045-1057; §JNC IV. *Arch Intern Med*. 1988;148:1023-1038; ¶JNC V. *Arch Intern Med*. 1993;153:154-183; #JNC VI. *Arch Intern Med*. 1997;157:2413-2446; **Chobanian AV et al. *JAMA*. 2003;289:2560-2572.

Most Common Adult Causes of Death in U.S. 2001

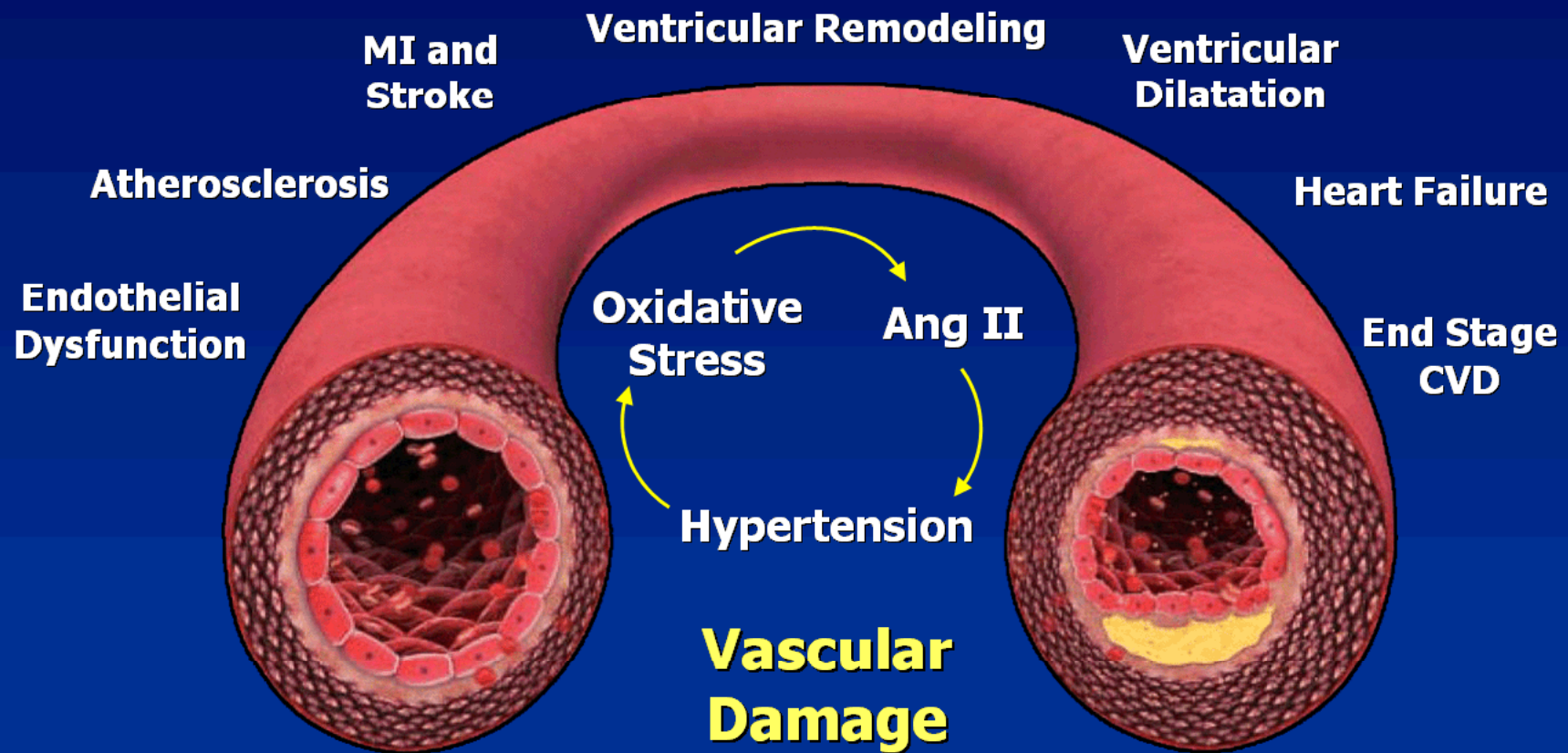
- Heart Disease *
- Cancer
- Stroke *
- Chronic Respiratory Disease
- Accidents
- Diabetes *
- Pneumonia/ Influenza
- Dementias *
role
- Renal Disease *
- Septicemia

* Hypertension plays a significant role

2001

source: National Center for Health Statistics

Ang II and Cardiovascular Risk



Adapted from Dzau V. *J Hypertens Suppl.* 2005;23:S9-S17.

Conclusions

- Each JNC Report is a result of the current and accumulated data
- Each JNC Report has become more specific in its recommendations
- JNC 8 will continue to focus on overall cardiovascular risk and is expected to be released in fall 2011.
- At the same time the Adult Treatment Panel IV (ATPIV-Cholesterol Guidelines) will be released along the new guidelines for obesity.